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"Keep your distance for me": A field experiment on empathy prompts to promote distancing during the COVID-19 pandemic

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Abstract

The outbreak of COVID-19 has turned out to be a major challenge to societies all over the globe. Curbing the pandemic requires rapid and extensive behavioural change to limit social interaction, including physical distancing. In this study, we tested the notion that inducing empathy for people vulnerable to the virus may result in actual distancing behaviour beyond the mere motivation to do so. In a large field experiment with a sequential case–control design, we found that (a) empathy prompts may increase distancing as assessed by camera recordings and (b) effectiveness of prompts depends on the dynamics of the pandemic and associated public health policies. In sum, the present study demonstrates the potential of empathy-generating interventions to promote pro-social behaviour and emphasizes the necessity of field experiments to assess the role of context before advising policy makers to implement measures derived from behavioural science. Please refer to Supplementary Material to find this article's Community and Social Impact Statement

KEYWORDS
behavioural public policy, case–control design, empathy, field experiment, physical distancing

The outbreak of COVID-19 has turned out to be unprecedented in terms of the global spread of infection and the resultant morbidity and burden on healthcare systems as well as the economic and social implications thereof (WHO, 2021). Even with (relatively) high levels of vaccination, curbing the pandemic requires rapid behavioural change to limit social contact. Accordingly, international public health organizations and virtually all national governments have made physical distancing the central target of their prevention strategy by implementing a diverse range of interventions, which include elements of education, persuasion, and environmental restructuring (Lunn et al., 2020; WHO, 2020a).

Whereas public support for distancing interventions has been high (e.g., Chu et al., 2020; Enria et al., 2021; Margraf, Brailovskaia, & Schneider, 2020), actually keeping distance from other people may not be so easy. In many social contexts, people are used to standing or sitting close to each other while talking or otherwise engaging in social interaction. Also, "keeping an arm's length distance" (WHO, 2009) when passing other people in public spaces is not a habitual behaviour. As a result, social triggers and habits may prevail in actual encounters even when people have adequate knowledge and good intentions to keep distance. This calls for situational prompts at the critical moment of getting close to other people to increase the likelihood that the distancing option is chosen.

In the present study, we tested whether people keep distance from others if they are prompted to do so by activating empathic concerns for other people. In a large field experiment with a single case design (Kratochwill et al., 2010), we tested whether inducing empathy for people vulnerable to the virus increases actual distancing as assessed by camera recordings. This set-up allows testing whether interventions that have been shown to increase motivation for distancing in a lab setting also work in the real world and translate into keeping distance from others at the moment it matters (Levitt & List, 2007).

1 | EMPATHY PROMPTS AND DISTANCING

In contrast to "protect yourself" messages that probably have limited impact among the general public because many consider themselves at low risk of severe consequences from COVID-19 infection, "protect each other" messages have been proposed as a promising intervention strategy with the potential of persuading people to change their behaviour for the benefit of others (Bonell et al., 2020; Everett, Colombatto, Chituc, Brady, & Crocket, 2020; Pfattheicher, Nockur, Böhm, Sassenrath, & Petersen, 2020). This especially applies to young people who may rationally decide to take the risk of infection against the alternative of reduced social interaction. Pro-social messages are thought to be effective because they increase empathy for people vulnerable to the virus. Research into the brain's mirroring properties suggests that people can have direct first-person access to the feelings, thoughts, and intentions of others. Perceiving or imagining emotions expressed by others activate a person's emotion system as if these emotions concerned themselves. These basic mechanisms of resonance and simulation allow them to predict and emotionally evaluate the consequences of their actions for others (Rizzolati & Sinigaglia, 2016).

These insights challenge the assumption that stands central in individualistic self-theories (see, for an exception, Sedikides & Brewer, 2002) that people are predominantly oriented towards the self and emphasize the fundamental essence of humans as social beings. In situations with competing behavioural options, prompting empathic processes may therefore trigger behaviour that serves these altruistic concerns (Batson, Duncan, Ackerman, Buckley, & Birch, 1981). Concrete images and the actual voices of those in need of protection linked to clear advice on how to implement distancing may thus help people to act in the collective interest during times of crisis (Drury et al., 2019).

A recent study provided initial evidence for the role of empathic mechanisms in increasing motivation for distancing during the COVID-19 pandemic: showing a movie clip of a vulnerable older person resulted in higher reports of willingness to keep distance (Pfattheicher et al., 2020). However, with the exception of a handful of studies demonstrating that empathy prompts may lead to actual behavioural change (i.e., adherence to professional handwashing protocols in a hospital setting to protect patients; Grant & Hofmann, 2011; Sassenrath, Diefenbacher, Siegel, & Keller, 2016), it is unknown whether empathy manipulations also support behaviour beyond the mere intention to do so. Moreover, the promising results of empathy inductions to promote motivation for behavioural change were obtained in an online setting, which provides proof of concept for the role of empathy but does not address the critical question of whether empathy will lead to pro-social action in the complex setting of the social world with multiple competing behavioural options.

In view of behavioural science making a contribution to more effective public policies (Benartzi et al., 2017; De Ridder et al., 2020), we set out to test whether empathy-based interventions are effective in the real world and lead to actual distancing. We therefore designed a field experiment at a university campus where we exposed students and staff to messages aimed to trigger empathizing with close others at risk (e.g., parents and fellow students with health conditions) at the very spots where there was a high probability of getting too close to each other. Young people in general and students in particular have been blamed for irresponsible behaviour and violating the COVID-19 distancing regulations (e.g., Berg-Beckhoff, Dalgaard Guldager, Tanggaard Andersen, Stock, & Smith Jervelund, 2021; Franzen & Wöhner, 2021; Nivette et al., 2021; Yang et al., 2020). To the extent this holds true, it is not likely attributable to low levels of willingness to comply with distancing rules (UK Office for National Statistics, 2020; Yang et al., 2020). Rather, it may point to the difficulty to prioritize distancing among other behavioural options in a concrete social situation. This suggests that increasing the salience of the distancing option by activating empathic concerns at the spot may help to act upon one's intentions.

2 | ETHICS STATEMENT

The study was conducted in line with the Declaration of Helsinki and the guidelines of the American Psychological Association. The project was approved by the Ethics Committee of the Faculty of Social and Behavioural Sciences, Utrecht University (file number 20-479), and a Data Protection Impact Assessment was made to comply with national privacy regulations in case of camera observations. As we did not collect data from individuals, observees were unable to give informed consent before starting the study. However, they were explicitly informed about camera recordings at the spot, and extensive information on the project's purpose and procedures was available from the university website. There was no deception of participants. The study was not preregistered but hypotheses were similar to those examined in a pilot study (approved by the Ethics Committee of the Faculty of Social and Behavioral Sciences at Utrecht University and filed under number 20-218) that was preregistered at osf.io/kvc9r, with the exception that the dependent variable was not motivation for distancing but actual distancing behavior. Data and materials from the present study are available at osf.io/kvc9r.

3 | METHOD

3.1 | Pilot study empathy and motivation for distancing

We first tested whether empathy was associated with motivation for distancing in a sample of 1227 community residents (56% female; $M_{age} = 65.4$, $SD = 17.8$), recruited from an existing online panel (inzicht.com). Participants were familiar with distancing regulations and endorsed governmental distancing guidelines, although a substantial number reported experiencing difficulties in adhering to these guidelines. To assess empathic tendencies, we employed a COVID-19 empathy scale designed for the specific purpose of this study. Higher scores on this scale were associated with higher motivation for keeping distance at a variety of public locations ($r = .54$; $p < .001$) and expecting to do so in the near future ($r = .45$; $p < .001$). Higher empathy scores were also associated with motivation for distancing in challenging situations ($r = .40$; $p < .001$). See supporting information (Data S1) for details. These findings confirm the results of previous research suggesting that empathy is a powerful driver of motivation for physical distancing (Lunn et al., 2020; Pfattheicher et al., 2020).

3.2 | Experimental study empathy and distancing

Next, we examined whether prompts for empathizing with vulnerable people would increase actual distancing on spots where people would be exposed to competing interests potentially interfering with their motivation for distancing. All people visiting campus during a 6-week period in the fall of 2020 were eligible when navigating one of three designated campus locations. Although by that time university was in partial lockdown with the majority of classes offered online, still a substantial number of people were present at the university premises, primarily students and occasional staff.

3.2.1 | Design and procedure

The study employed a single case A-B design (Kratochwill et al., 2010), with three sequences of control (A) and experimental (B) weeks to determine the effects of an empathy prompt intervention for promoting distancing at three campus locations (square outside college hall, main entrance lecture hall, and entrance lecture rooms; see supporting information [Data S1]). This design allows for replications to control for potential external influences such as developments in COVID-19 prevalence and associated prevention policies at the local and/or national level, which may influence intervention effects. During the entire 6-week period, inter-person distance of people at the designated spots was continuously registered by camera recordings. Human observers trained in anthropological field research registered how participants responded to the intervention on the spot.

3.2.2 | Materials

The intervention consisted of three elements, all with the aim to induce empathy-based distancing at the very spots where keeping a distance was challenging and comprising engaging features that went way beyond simple textual messages (Favero & Pedersen, 2020): (a) a social robot encouraging people to keep distance in response to facial recognition of people entering the main entrance of the lecture hall (note that halfway through the experiment, existing university regulations about wearing face masks at campus became stricter with more frequent wearing of face masks as a result; this made face recognition impossible and at that point the robot was reprogrammed to express text at regular intervals); (b) pictures of student and staff models with a text expressing a prompt for empathy-based distancing (e.g., "I have asthma. Keep your distance for me") printed on life-size (85×200 cm) banners and placed near the main entrance of the lecture hall; and (c) a rail of movie clips of the same models with the same texts shown on screens ($\sim 100 \times 200$ cm) placed close to the entrance of the main rooms in the lecture hall and on a large led screen ($\sim 200 \times 300$ cm) at the square outside the lecture hall (see supporting information [Data S1] for sample pictures of robot and banners). These materials complemented existing university policies on promoting COVID-19 preventive behaviour, which consisted primarily of information on distancing and hand hygiene measures (www.uu.nl/en/information-coronavirus/coronavirus-buildings-and-facility-services). All materials were shown in intervention weeks only. During control weeks, the robot and banners were removed and movie screens were black.

3.2.3 | Data processing

Distancing was assessed by estimating inter-person distance from camera recordings (Ubiquiti Unifi Video Gen-3). Cameras were installed at the three designated locations and spanned a field view of 85° horizontally and 44.8° vertically, which resulted in a square of about 10.5 × 5 m at a height of 6 m (main entrance lecture hall) to 27.5 × 12.4 m at a height of 15 m (at the square outside college hall). These cameras continually registered the movements of people circulating the premises during the entire study period. Cameras approached a bird's eye (top-down) view, so as to decrease the chance of facial recognition and protect participants' privacy. During the data collection period, camera recordings between 8:00 a.m. and 6:00 p.m. on weekdays were extracted from the Ubiquiti storage device using a custom Python 3.7 script. Data from these recordings were converted to 3,600 frames per hour (fph) and further reduced by selecting 120 fph (data reduction with a factor 30). Initial data processing comprised the transformation of recorded inter-person observations into pixel distances, which were subsequently converted to distances in metres by using Tensorflow Object Detection AP (see supporting information [Data S1] for details on the data processing procedure).

3.2.4 | Outcomes

To assess intervention impact, we employed two outcomes. First, we calculated the average of all distances <2.5 m within a frame (cluster mean distance; CMD), arguing that people who are farther than 2.5 m apart from each other are more likely to be coincidentally present within the same frame with sufficient space between them. Their large inter-person distances would easily distort the average distance within a frame when included. Figure 1 is a graphical representation of how distances between people were determined. Relative distances were preferred over an absolute cut-off of 1.5 m as advised by public health authorities, reasoning that more distance is better (even if it is less than the recommended 1.5 m) and that many people would have trouble with exactly applying the arm's length rule. CMD serves as the psychological evaluation of the experiment, that is, the extent that people responded to a call on empathy for distancing. Second, we employed a more stringent outcome incorporating the epidemiological-virological notion that safer encounters between people are not a linear function of distance, with risk of infection being disproportionally higher in the range of small distances as compared to larger distances (Chu et al., 2020; Jones et al., 2020). We therefore computed a measure capturing the mean of weighted distance between people in a frame (i.e., distances A and D weigh more than distances B and E, which in turn weigh more than distances C and F; see Figure 1). The weighted distances have a 0–1 scale (with averages closer to 1 representing safer distances) according to the exponential function 1–1/(1 + exp(4*[distance – 1])); see Figure 2 and supporting information (Data S1) for details. Here, all distances larger than 2.5 m receive a weighted value close to 1, which limits their impact on the frame average, especially when the distance is very large (e.g., 10 m). As this second outcome (weighted mean distance; WMD) is a measure of average safety within a frame, it serves as the evaluation of the experiment in terms of its public health implications.

3.2.5 | Predictors

The main predictor in this study was condition (either control or intervention). As a covariate, we assessed the number of inter-person distances observed within a frame, as crowding is known to decrease inter-person distances

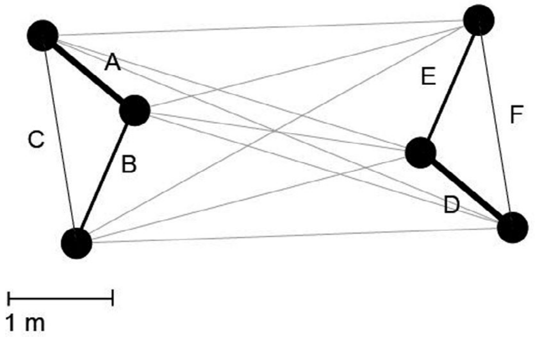

FIGURE 1 Example of distances between six people, represented as black dots. All grey lines represent distances between people larger than 2.5 m, whereas black lines represent distances smaller than 2.5 m. The average of all distances in black represents the outcome of CMD. The boldness gradient of these lines represents how much distances are weighted in the outcome weighted mean distance, with less bold (smaller) distances being weighted more

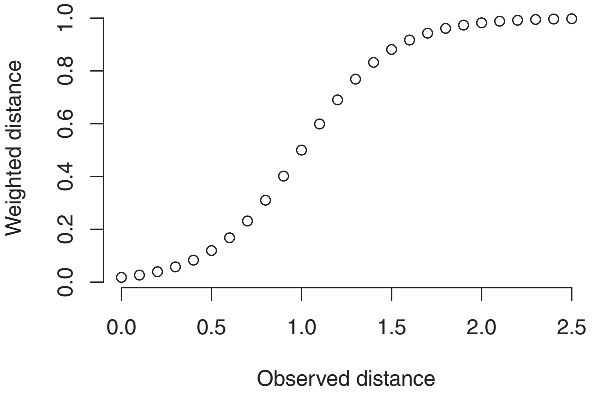

FIGURE 2 Weighted mean distance as an exponential function of observed distance

(e.g., Leiter, Reilly, & Vonnahme, 2021). Including the covariate in the analyses allows for examining coincidental differences in crowding between the control and intervention weeks.

3.2.6 | Analyses

We employed an autoregressive AR(1) model to evaluate the effect of the empathy intervention on both distancing outcomes, with condition as the main predictor and the number of distances in a frame as a covariate to account for crowding. The AR(1) model takes interdependence of data (resulting from selecting multiple frames in a specific period of time) into consideration. Autocorrelation for the CMD outcome (CMD_t and CMD_{t-1}) was .463, and autocorrelation for the WMD outcome (WMD_t and WMD_{t-1}) was .267. To test experimental effects, we computed a permutation test in R to obtained *p*-values for the condition regression coefficient on both outcomes. The permutation test allows for dealing with non-normally-distributed residuals in an appropriate manner. A positive value of the condition regression coefficient means that people keep more distance in the intervention week. With CMD as an outcome, the coefficient can be interpreted as the difference between conditions in mean distance (in meters). In case of WMD, a larger coefficient (closer to 1) suggests safer distances with lower risk of virus transmission. All data and scripts have been published on the pre-registration page: https://osf.io/kvc9r/.

TABLE 1 Permutation test of cluster mean distances (CMDs) by condition (N = number of distances between people in clusters of ≥2 people within 2.5 m distance)

Sequence	*N* control	*N* intervention	CMD coefficient	SE	*p* value
1	147	545	.35	.09	<.001
2	329	371	−.38	.07	<.001
3	134	272	.18	.09	.050

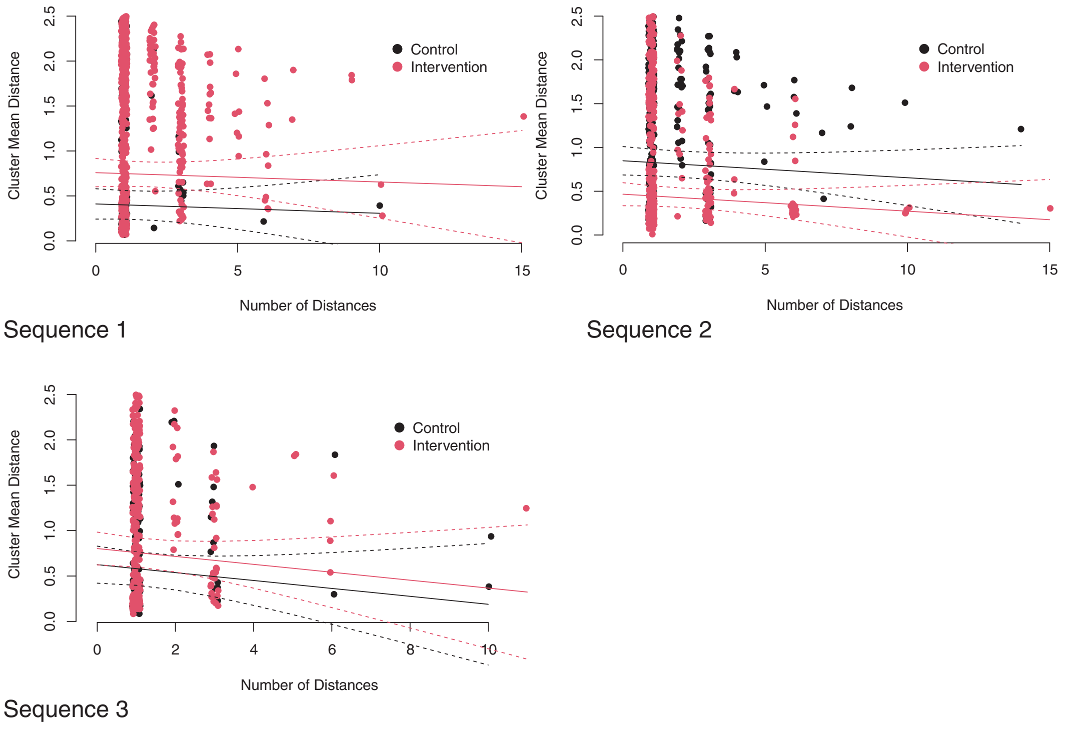

FIGURE 3 Plots of cluster mean distances by condition per sequence

4 | RESULTS

In accordance with our single case design, we tested three sequences of control versus experimental weeks as a series of replications to account for potential influences of the dynamics in COVID-19 prevention policies. We first examined the average distance between people present within a specific cluster (CMD) to evaluate the psychological impact of empathy on keeping a distance from other people in the near surroundings while accounting for the number of people present. Our analyses show that the experimental condition in both the first and third sequence differed significantly from the control condition in such a way that during experimental weeks people kept more distance from each other, varying from 35 cm in the first sequence to 18 cm in the third sequence (see Table 1). The second sequence was also significant, albeit in the opposite direction, showing that people in the control week kept more distance (up to 38 cm) than in the intervention week. Figure 3 shows plots of actual distances accounting for number of people present. These plots demonstrate a clear difference between conditions in case of small groups up to about five people, which becomes less distinguished with more people in a scene (sequence 1) or is already less

TABLE 2 Permutation test of weighted mean distances (WMDs) by condition (N = number of weighted distances between clusters of ≥2 people)

Sequence	*N* control	*N* intervention	WMD coefficient	SE	*p* value
1	324	996	.06	.02	.002
2	723	715	−.08	.02	<.001
3	267	535	.04	.03	.150

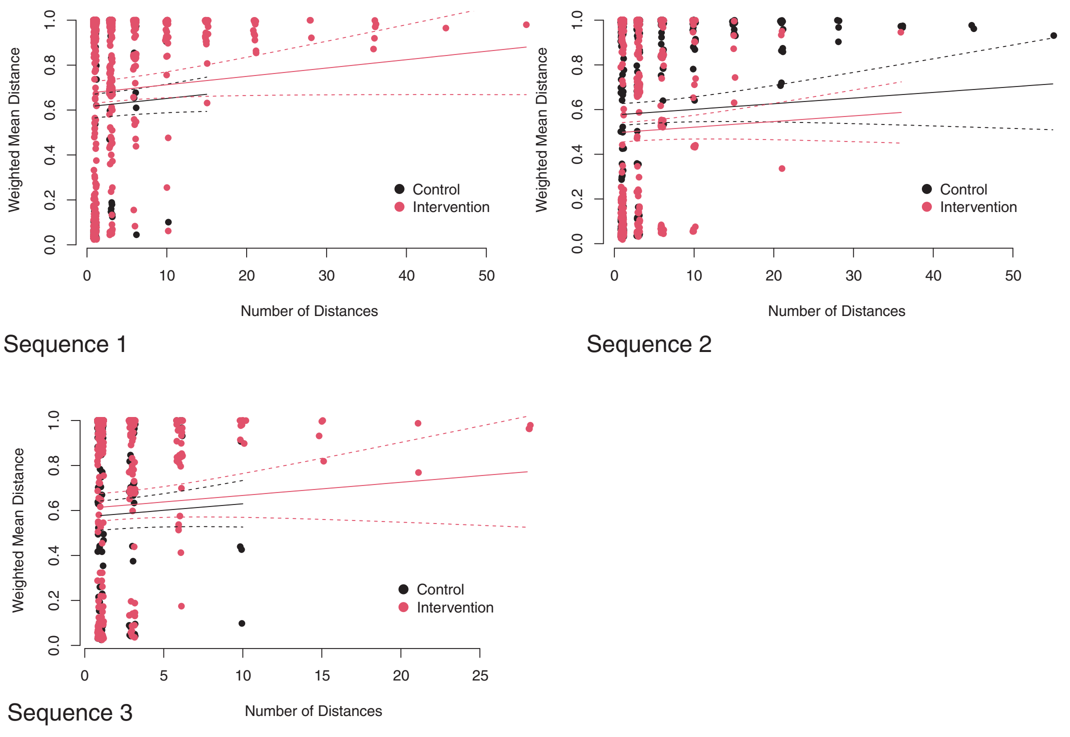

FIGURE 4 Plots of weighted mean distances by condition per sequence

distinguished in smaller groups (sequence 3); the plot of sequence 2 reveals a picture similar to sequence 1, with smaller groups keeping relatively more distance in the absence of empathy prompts than larger groups.

Next, we tested the same sequences of intervention versus control weeks by examining the more stringent outcome of WMDs. Note that these analyses comprise a larger number of distances than the CMD analysis, as we did not apply a maximum of 2.5 m distance between people within a cluster. The findings reveal a similar pattern as those from the CMD analysis, although the third sequence no longer shows a significant difference between the experimental and the control condition (see Table 2 and Figure 4). The significant positive coefficient in the first sequence shows that people in the intervention condition kept a factor of .06 safer distances from each other as compared with the control week, whereas the negative coefficient in the second sequence signals a factor of .08 more unsafe distances.

Next to measures of actual distancing, responses to interventions were documented by human observers. These observations (N = 1186) revealed that a minority (less than 50%) of participants paid explicit attention to the interventions (e.g., by laughing at the robot, standing still in front of the screen to watch the film clip, or pointing to the banners). According to observations, getting close to other people was more prevalent in situations where physical arrangements made it challenging to keep a distance (e.g., narrow doors or corridors at the entrance of college hall or lecture room) or when students were required to get closer (e.g., having a conversation with face masks covering their face). Exit interviews ($N = 42$) during the final intervention week revealed that many students did not pay explicit attention to the intervention because, according to their own interpretation, they were in a hurry, talking to each other, or watching their phones. Interviews also showed that the majority of interviewees supported COVID-19 prevention measures but were uncomfortable with (from their perspective) unclear and inconsequent regulations as well as with frequent and unexpected changes of regulations.

5 | DISCUSSION

We set out to test whether empathy prompts, proven effective in increasing motivation for distancing in a clean lab setting, would affect actual distancing behaviour in the real world where competing interests may interfere with putting intention into action. Our results do not provide conclusive evidence that a call on empathy causes people to keep distance from others. We found significant positive effects in two out of three sequences, with people during intervention weeks standing up to 35 cm farther away from each other while accounting for the number of people present at a specific time and spot. These findings demonstrate the potential of our intervention in psychological terms. When applying a more stringent approach, accounting for the notion that safer distances are not a linear function of actual distance, our findings are mixed with only one out of three sequences showing a significant effect and one sequence showing a non-significant trend of keeping more distance in response to empathy prompts.

Despite these promising findings, it should be noted that we found an opposite effect of the intervention (rather than a null effect) in the second sequence of the study. This finding is puzzling and we can only speculate why this would be the case. We purposefully employed a case–control design so as to account for external influences that were associated with rapidly changing measures to stop spreading of the virus. The opposite pattern coincided with the announcement of more rigorous measures (e.g., groups of maximum two people in public spaces; closing down of all cultural and sports activities), as exemplified in a higher score on the COVID-19 Stringency Index (https://ourworldindata.org/grapher/covid-stringency-index). Also, existing university policies about face masks were more strictly applied during this period, leading to more consistent wearing of face masks. This may have contributed to the feeling that distancing was less important than it was before. Alternatively, it may be that the declaration of a stricter policy (after a long period of milder restrictions) elicited reactance, resulting from pandemic fatigue (a state of being worn out by the threat of COVID-19 and the surrounding precautionary measures; WHO, 2020b). Our interviews with students corroborate this interpretation, as they show that many grew tired of policies lacking a clear direction, in spite of their overall understanding of these rules (cf., Mintrom & O'Connor, 2020). However, it should be noted that the concept of pandemic fatigue has been criticized (Michie, West, & Harvey, 2021). Moreover, it is unclear whether pandemic fatigue primarily relates to support of mitigation measures or also affects actual behavioural adherence (Harvey, 2020).

Our research has a number of limitations. First, as we ran our study at a university campus with (mostly) knowledgeable students and staff, it is uncertain whether empathy prompts would work differently in community settings. Nevertheless, in view of reports suggesting that especially young people would comply to a lesser extent with COVID-19 measures (e.g., Yang et al., 2020), our results are encouraging. A second limitation is inherent to running a field experiment with fluctuating numbers of observed people and incidental technical failures in camera recordings or the display of intervention formats. However, the very notion that despite these constraints we were able to detect at least some effects speaks for the potential applicability of empathy prompts. Third, power issues related to the relatively low number of people present at campus do not allow for an in-depth investigation of potentially relevant aspects of the intervention context. It would have been interesting to examine the impact of location features on responsiveness to empathy prompts because people may react differently depending on, for example, whether they transit from outside to inside, which may remind them of the necessity to behave more cautiously.

Notwithstanding these limitations, our findings bear implications for investigating the role of empathy in promoting prosocial behaviour beyond mere motivation in future studies. In particular, the role of explicit or implicit attention in determining whether empathy engenders adjustment of behaviour requires more insight. Another promising avenue lies in examining whether empathy prompts are sufficient for behaviour change or should be supplemented with clear suggestions of behavioural options. Specifically in case of distancing, responding to empathy prompts may be compromised by few opportunities for keeping a distance, such as when many people are around.

Altogether, our research is important in three ways. First, our study extends previous studies on the role of empathy in promoting prosocial behaviour. Whereas it has been shown that empathy may increase motivation for pro-social behaviour (e.g., Pfattheicher et al., 2020), we, for the first time, demonstrated that a call on empathy might also influence actual behaviour—even though this effect may depend on the probable influence of the stringency of COVID-19 mitigation measures. Moreover, it can do so in challenging circumstances with a multitude of distractions being present. By doing so, we replicate existing research with sophisticated measures in an ecologically valid context and an advanced iterative design. Second, our research also shows the crucial role of context. Empathy manipulations that work well in a controlled setting may not turn out to be effective in a context where people do not pay explicit attention and, for example, overlook a big screen with film clips of vulnerable people. The very finding that only a minority of students reported to have noticed the interventions may suggest a case of inattentional blindness (Simons & Chabris, 1999), where people miss out on salient but unexpected information because they were busy with getting to a lecture or rushing to their next appointment. However, in view of recent research suggesting that a reflective mind is not required for noticing subtle hints in the environment to adjust one's behaviour (De Ridder, Kroese, & Van Gestel, 2021; Van Van Gestel, Adriaanse, & De Ridder, 2020), our findings suggest that even in messy contexts empathy prompts may generate some effect. Third, we suggest that testing of promising concepts in a real-world setting is not only important in view of replication but also, and perhaps even more, in view of behavioural science making a contribution to solving pressing societal problems (Benartzi et al., 2017). In debates about the best public health response to the COVID-19 pandemic, references have been made to the crucial role of behavioural science in designing effective prevention campaigns (Bonell et al., 2020; Van Bavel et al., 2020). However, so far most claims on the impact of behavioural insights to curb the pandemic have remained untested insomuch as the large majority of studies employed a correlational design and used self-reports of motivation and intention to adhere to the rules rather than actual behavioural measures (for an exception, see Suonperä Liebst, Ejbye-Ernst, De Bruin, Thomas, & Rosenkrantz Lindegaard, 2021). If behavioural scientists want their insights to be relevant for developing effective policies, experimental field tests are required to estimate the potential contribution of these insights. As the success of controlling the COVID-19 pandemic relies on people's ability to adjust their behaviour, we need sound evidence showing that interventions employing empathy indeed facilitate people in acting upon their motivation.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are openly available in OSF at https://osf.io/kvc9r/., reference number kvc9r.

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